excision en masse of all disease-bearing tissue down to fascia. (Fig. 21.) The writer prefers the latter for the following reasons:

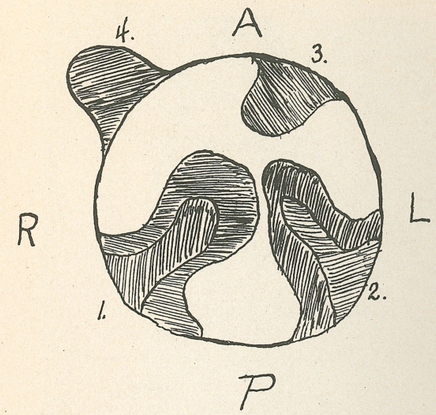

FIG. 22. Diagrammatic representation of location, type, and extent of anal pathology, for use on patient's history sheet. R, right; L, left; P, posterior; A, anterior. 1 and 2, combined internal and external hemorrhoids. Fissures, fistulae, polyps, ulcers etc., may be similarly located on the chart.

1. Removal en masse permits one to work only in clean healthy tissue by employing an elliptical incision encompassing all diseased tissue, even an entire abscess, leaving a clean dry uninfected wound.

2. Such a wound may be closed immediately, after undermining the edges, with a fair chance of obtaining primary union and thereby saving many weeks of wound care. Even if the wound is left open and packed with gauze, healing is cleaner and more rapid.

3. In the rare case where the disease extends beyond the fascia, a better opportunity is afforded for radical extirpation of such disease.

4. There is less likelihood of leaving a portion or branch of a sinus behind, to make recurrence inevitable.

One disadvantage is that for en masse extirpation the patient must usually be hospitalized for three to six days, while simple sinus exposure and coagulation may under suitable conditions be safely performed in the office.

A simple diagram is made on the patient's chart, showing the approximate locations and size of the operative areas. (Fig. 22.) This chart has assisted materially in subsequent follow-up examinations. Should a patient return with more hemorrhoids, or other pathology, reference to the diagram will indicate whether or not the mass or masses recurred in the previously operated area or have formed anew in areas not operated upon. The patient is not discharged until healing is complete and his case is followed for at least a year subsequent to operation.

SUMMARY

1. A brief résumé of the electrosurgical treatment of rectal diseases has been presented.

2. Over 1,100 cases have been treated by methods described.

3. Compared with other methods the following advantages are claimed:

(*a*) Under suitable conditions, most patients may be treated in the office.
(*b*) There are no complications such as serious infection, fissure, fistula, ulcer, abscess, stricture or incontinence.
(*c*) There is no blood loss.
(*d*) Secondary hemorrhage is rare.
(*e*) Recurrence is extremely rare.
(*f*) Convalescence is much shorter and much more comfortable than with other methods.

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SURGERY OF RECTAL DISEASES BY ELECTROTHERMIC METHODS

BASED ON 1,100 CASES

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THE use of high frequency current in the treatment of surgical diseases of the rectum was first undertaken by the author about ten years ago after several years of dissatisfaction with other methods known up to that time. In 1931, some 200 cases of hemorrhoidectomy by surgical diathermy were reported.[1] The technique then employed, with certain refinements, has proved so suitable in other rectal conditions requiring surgical intervention that a brief review of its salient features and diverse applicability is presented, in the belief that better results will be the reward of utilizing this method of management.

A critical review of the 1,100 cases embodied in the present report discloses no reason for revising the conclusions previously cited in the summary of advantages, namely: practicability as an office procedure under favorable conditions; minimum loss of blood; freedom from complications, such as fissures, ulcers, abscesses, strictures, or loss of sphincter control; absence of recurrences; short and comfortable convalescence. The present series includes, in addition to external and internal hemorrhoids, fissure-in-ano, fistula-in-ano, pararectal and ischiorectal abscesses, benign and malignant neoplasms, strictures, and pilonidal sinuses, abscesses and cysts.

Although W. L. Clark,[2] after years of experience, urged the use of electrothermic methods in rectal surgery in 1911, a surprisingly large part of the profession is still unfamiliar with the procedure. Mistaken employment of the bipolar current, causing excessive scar formation with resulting stricture, sphincter injury and other complications, has doubtless prompted others to view all electrothermic methods with disfavor. The technique developed by the author emphasizes the uses of the *monopolar current* in these conditions. It is quite sufficient for most purposes, and only exceptionally are the other currents used, as will be shown below.

HEMORRHOIDS

Preparation for Operation. A mild cathartic is given on the night before operation. If there is chronic constipation, a sodium bicarbonate enema should be administered at least two hours before the operation. However, in case there has been a normal, regular movement on the morning of operation, no further measures are taken. Indeed, it is preferable to avoid an enema, as there is then less likelihood of soiling the operative field. An hour before operation the patient is given 10 grs. of soluble barbital by mouth. (Any form of barbiturate may be used.) This is routine as a prophylactic against the toxic effects of novocaine so frequently exhibited by patients. Its employment, thanks to the work of E. G. Martin,[3] has eliminated troublesome, occasionally serious reactions previously encountered. To neurotic patients, a preliminary hypodermic of morphine sulphate, gr. ¼, and atropine sulphate, gr. 1/150, is administered.

Anesthesia. Caudal anesthesia is ordinarily used. Novocaine, 25 to 30 c.c. of a 2 per cent solution, injected into the caudal canal through the caudal hiatus, provides a most effective anesthesia. It is superior to local infiltration because (1) one needle prick only is necessary, while local infiltration requires several needle insertions in a very sensitive area, (2) the operative field is not distorted: (3) the sphincter ani is not

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injured; (4) it can be used in spite of edema, thrombosis, ulceration or prolasep without danger of infection. The injection

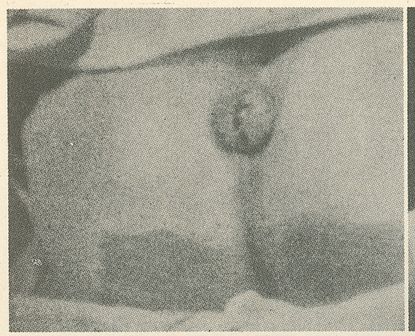

Fig. 1. Successful sacral anesthesia, sphincter relaxed and hemorrhoidal masses bulge outward.

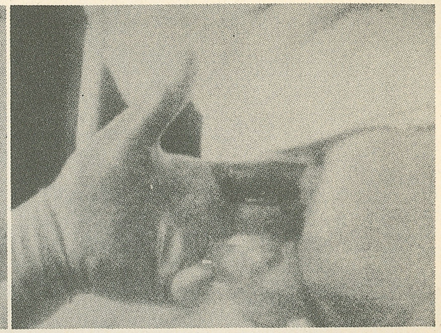

Fig. 2. Completely relaxed sphincter easily divulsed by separating index and middle fingers.

completed and dressing applied, the patient is immediately placed in a lithotomy position and draped, and the perineum is painted with a 3½ per cent solution of iodine.

Inspection and Palpation. The anal region is inspected for pathologic conditions and tested for relaxation of the sphincter. Successful anesthesia produces a completely relaxed sphincter which does not contract when irritated (by the iodine or by pinching the overlying skin). No resistance is offered to gentle divulsion, and examination of the anus and rectum is quite easy. (Figs. 1 and 2.) With a hand on either side of the anus, traction of the skin stretches the sphincter and everts the external and internal hemorrhoids. A clear view is also obtained of fissures, ulcers, polyps, and other pathologic conditions which may exist. Further examination is carried out with the help of a Cook's rectal speculum and, if necessary, proctoscopy.

Equipment. A good diathermy machine capable of delivering a steady spark at least ¼ inch in length, using the monopolar current, is all that is necessary in addition to the usual set-up. Bipolar and cutting currents should also be available; however, as previously emphasized, the bipolar current should not be used for hemorrhoidectomy. The monopolar current is suitable for the removal of most tumors the size of hemorrhoids, requires but little experience for its safe employment, and causes minimum scarring and practically no secondary inflammation.

Operation. With an Allis clamp, the largest external mass is grasped above the mucocutaneous junction and pulled radially, i.e., away from the center of the anal opening. This causes partial or complete eversion of the internal hemorrhoidal mass which is usually found in the same radial plane, with perhaps a slight narrowing at the sphincter, the so-called externo-internal or combined hemorrhoids. (Figs. 3 and 4.) This internal component is now grasped with a second Allis clamp and drawn in the same direction as the first clamp. If the entire internal mass has not thereby been drawn out of the anal canal, a third or even a fourth Allis clamp may have to be applied in the same radial plane as the first and second clamps and traction made outward until the entire mass is exposed. The hemorrhoid clamp is now applied to the base of this combined mass and locked. (Fig. 5.) The base is sometimes so long in its long axis that it occupies the entire length of the hemorrhoid clamp. A second hemorrhoid clamp may even become necessary. Traction of the Allis clamps should be

gently and evenly made; otherwise some of the innermost fibers of the sphincter muscle will be caught in the hemorrhoid

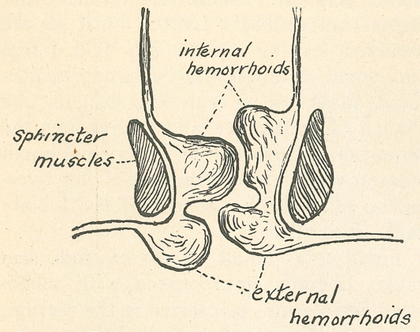

Fig. 3. Diagram in sagittal section of usual arrangement of combined internal and external hemorrhoids.

clamp with resulting postoperative sphincteralgia. A strip of sterile gauze is placed all around the clamp posteriorly, separating the clamp from the underlying anus and adjacent skin. The mass is now ready for electrodesiccation. The Allis clamps are removed and the needle electrode is applied to the mass, the current turned on with the foot-switch while an assistant holds the hemorrhoid clamp. The entire outer surface of the mass is sprayed with the monopolar spark until it becomes gray in appearance. Then the needle is plunged into the mass at regular intervals, thereby desiccating the entire mass in a methodical manner. (Fig. 6.) Boiling fluid and steam, not smoke, will be seen coming from the tissues. Blood caught in the hemorrhoid will trickle out through the puncture holes made by the needle. The needle acquires, from time to time, a coat of coagulated blood or tissue which must be scraped off; otherwise resistance to the transmission of current results, causing sparking from other parts of the electrode.

When the hemorrhoidal mass is dry, gray and shrunken in appearance (Fig. 7) it is cut off flush with the clamp. (Fig. 8.) This may be done with scissors, as is preferable, or with the cutting current of Wyeth. The stump is now treated very thoroughly with the monopolar spark. (Fig. 9.) Not until the stump is thoroughly

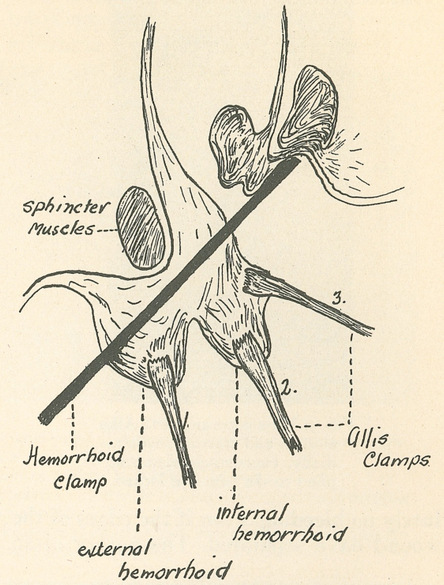

Fig. 4. Application of hemorrhoid clamp (represented by heavy black line) after masses have been pulled downward and outward with Allis clamps, care being taken to avoid the sphincter ani.

dry, almost charred, is the hemorrhoid clamp released, *only one notch at a time*, the stump being further desiccated as it is held between the blades of the clamp. Opening the clamp very slowly enables the operator to detect hemorrhage from inadequately treated areas, which can be controlled at once. It should be remembered that the stump is continuously under traction while in the clamp. Any hemorrhage, especially from the innermost ends of the stump, would at this time be most troublesome and should be avoided by the alternate one-notch-at-a-time release of the clamp and desiccation between the blades until it is evident that the stump is dry and clean. Should bleeding occur, it is treated by further desiccation after insertion of a speculum if necessary; or the bleeding

point may be grasped with an artery clamp and coagulated. If the operation is properly performed, however, there should be absolutely no bleeding, even if the edges of the wound have separated. The author often deliberately separates the edges in demonstration when questioned regarding the possibility of hemorrhage from such a mishap, but nothing other than some negligible oozing occurs. The stump is then released and allowed to return into the anal canal. (Fig. 10.) Successively, the other masses are similarly treated until all are removed, leaving a clean, dry field. Large and small external and internal hemorrhoids may now be removed, reducing the chance of recurrence and preventing the formation of new hemorrhoids from small masses which at the time are either overlooked or invisible because of the bloody field. (Fig. 11.)

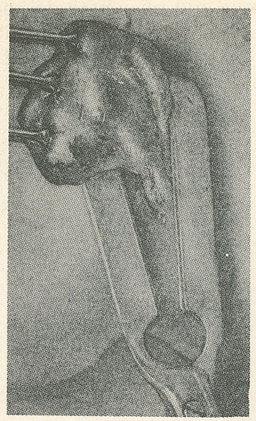

FIG. 5. Mass is grasped with Allis clamps and traction made radially. Hemorrhoid clamp applied to the base and locked.

Finally, a small strip of iodoform gauze, liberally impregnated with carbolated petrolatum, is inserted in the rectum. (Fig. 12.) The external end of the strip is pinned or sewed to several squares of gauze which are pressed against the anus. A thick pad held in place by a T-binder is now tightly applied to the perineum. A very efficient T-binder may be made of web elastic 2 inches wide. One strip is fitted around the waist and held with safety pins; the other goes snugly around the perineum, pinned at each end to the waist band and also to the perineal pad to hold the latter in place.

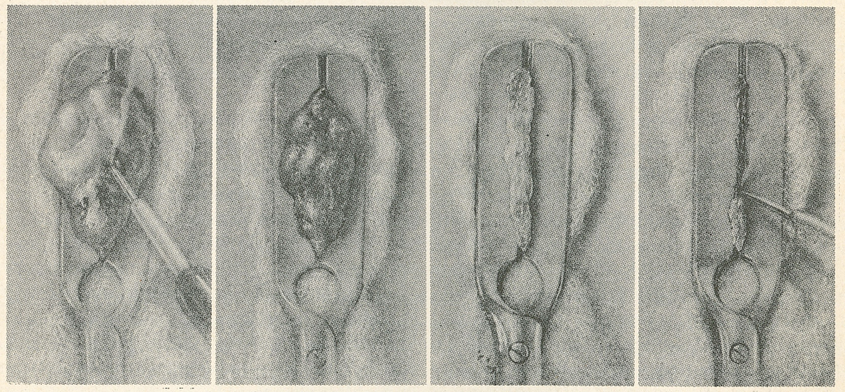

FIG. 6. FIG. 7. FIG. 8. FIG. 9.
FIG. 6. Application of electrode to the hemorrhoidal mass using monopolar current.
FIG. 7. Shrunken appearance after complete desiccation.
FIG. 8. Mass cut off flush with clamp, leaving a desiccated stump.
FIG. 9. Stump of hemorrhoidal mass thoroughly treated with monopolar current until coagulated.

The duration of the operation, depending upon the number of masses removed, is from fifteen to thirty minutes, occasionally longer. Toward the end of a long operation, but usually after the operation has been completed, a patient may complain of burning of varying degree. This burning sensation is of short duration, rarely lasting for more than half an hour, and is quickly alleviated by a hot water bag or an electric pad applied to the perineum. A word of caution should be heeded here about the use of an electric pad or hot water bag: due to pain or the burning sensation, the patient may not be aware of the amount of heat exhibited by bag or pad, and unless care is exercised a severe burn of the buttocks or back may be produced, to the chagrin and discomfiture of all concerned. If the immediate postoperative burning is excessively severe, a hypodermic injection of morphine and atropine is given.

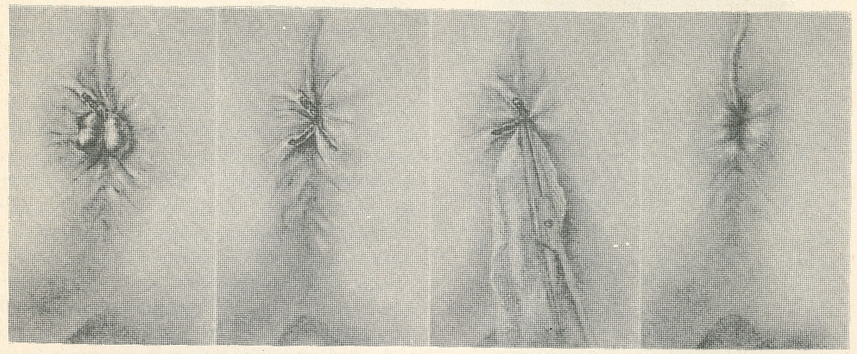

FIG. 10. FIG. 11. FIG. 12. FIG. 13.
FIG. 10. Stump released and allowed to return into the anal canal. Two more hemorrhoidal masses visible. These are treated in a similar manner.
FIG. 11. Operation completed, showing clean, dry stumps of excised hemorrhoidal masses
FIG. 12. Inserting iodoform gauze impregnated with carbolated vaseline. It is pinned to the perineal dressing which is next applied.
FIG. 13. Appearance two weeks later, wounds entirely healed and covered with new mucous membrane. No scars visible. Operative field soft and pliable.

In the past few years, to counteract postoperative burning or sphincteralgia, use has been made of the oil soluble anesthetics developed by Yeomans, Gorsch, Morgan and others, such as:

1. *Benacal* (Yeomans)—five parts each of ethacaine and phenmethylol in ninety parts of purified sweet almond oil.

2. *Anucaine* (Gorsch)—five parts each of benzocaine and phenmethylol, one part butyl aminobenzoate and one-eighth part novocaine base in sweet almond oil.

3. *Proctocaine* (Morgan)—basic novocaine 1.5 per cent, butesin 6 per cent, benzyl alcohol 10 per cent, in almond oil.

At the conclusion of the hemorrhoidectomy, especially if extensive or prolonged beyond the duration of the caudal anesthesia, 5 c.c. of the solution is injected into the sphincters posteriorly at about 4 and 8 o'clock. By this means relief of postoperative burning, and pain and sphincter spasm following bowel movements has been most satisfactory, often eliminating the need for any other measures for several days and even weeks.

POSTOPERATIVE CARE AND COURSE

With slight modifications due to location and extent, anorectal operations conform closely to hemorrhoidectomy in postoperative care and course. The patient is kept in bed for two days but is allowed bathroom privileges. Normally, patients pass through a very comfortable postoperative period and in most instances are able to return to work or carry on their usual activities after from four to seven days depending on the

extent and severity of the condition. Examination of the wound next day will reveal a remarkable absence of reactive

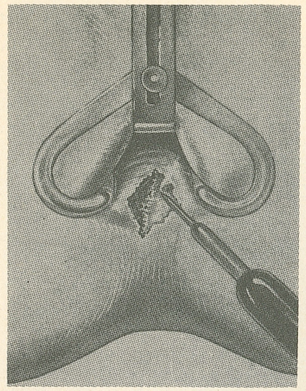

Fig. 14. Fissure-in-ano. Using the monopolar current, the entire base and edges of the fissure are thoroughly desiccated, regulating the strength of the current according to the depth of the diseased tissue.

inflammation. So little have the tissues been damaged that edema, swelling, tenderness, or other evidence of operative trauma, are rarely present. Soon after the second day the coagulated stumps of hemorrhoids begin to slough slightly and separate from the underlying granulating base. From this time until complete healing takes place, about two weeks, there may be a few drops of blood in the stool, or the stool may be blood-streaked. The stool in its passage over the granulating surface causes some bleeding, usually negligible, which stops after the bowel movement and may not be noticed.

Secondary hemorrhage is never to be feared if the technique has been carried out in detail as described. Approximately two weeks after operation the wounds are healed and covered with new mucous membrane (or skin). Scars are seldom visible and, when palpated, are found to be soft and pliable. (Fig. 13.)

Diet and Catharsis. The patient is allowed a soft diet for two days. After the second day, one tablespoonful of an agar oil emulsion may be taken at night, if necessary. After each bowel movement, the anal region in gently washed with a sponge and warm soapy water, and carbolated petrolatum is applied on gauze. It is desirable not to have a bowel movement until the third morning, thereby permitting the operative area to rest. On the second postoperative day, the iodoform gauze packing is removed. Daily, thereafter, morning movements, usually painless, are to be encouraged. A warm olive oil enema, to be retained for ½ to ¾ hour, is very helpful to reduce discomfort or pain of bowel movements. More than one movement daily results in tenesmus. Cathartics or oil should be discontinued, and the tenesmus should be controlled by heat (electric pad, hot water bag or sitz-bath). Rarely are sedatives required, especially if an oil soluble anesthetic has been injected into the sphincters.

FISSURE-IN-ANO AND ULCER

Definition and Pathology. Anal fissure is an irritable ulcer, producing spasm of the sphincter with violent burning pain during defecation or, more usually, after the movement. The pain may last for hours. Examination shows a radial fissure, chronically inflamed and irritated, usually posterior, extending into the anal canal for about ¼ to ½ inch. Hemorrhoids may also be present.

For the eradication of this simple but often most excruciatingly painful condition, monopolar desiccation has proved to be a most valuable agent. It surpasses other known methods both in facility for use and thoroughness with which it removes the ulcer and destroys all inflammatory tissue with a minimum of reaction and postoperative discomfort.

Technique of Operation. After thoroughly cleansing the parts, the area around the fissure is infiltrated with 2 per cent novocaine. Infiltration with an oil soluble anesthetic is even better; indeed, for simple

acute ulcers it may be all that is necessary, putting the part at rest and thereby inducing healing. In case hemorrhoids or other conditions are present, it is best to use caudal anesthesia. The sphincter is then dilated, a Cook speculum inserted and the blades opened. Due to the stretching, the fissure usually appears triangular, its apex pointing into the bowel.

Using the monopolar current, the entire base and edges of the ulcer are thoroughly desiccated, regulating the strength of the current according to the depth of the diseased tissue. (Fig. 14.) Ordinarily, a ⅛ inch spark is sufficient for the purpose of producing a dry coagulum, sealing nerve ends, lymphatics and blood vessels, under which a healthy layer of granulation tissue forms after a few days. For dressing, a thin strip of iodoform gauze impregnated with carbolated petrolatum is inserted a short distance into the canal, with the external end attached to a sterile gauze pad applied to the perineum. Rarely is a postoperative sedative necessary.

On the following day a warm olive oil-glycerine enema will initiate a bowel movement. The average time in bed is twenty-four hours. If hemorrhoids are present they are treated as described above. Details of postoperative care will vary only in degree from the general measures given above.

PARARECTAL AND ISCHIORECTAL ABSCESSES

Abscesses about the anus and rectum, according to their location, are of four types: anal, submucous, ischiorectal, and pelvirectal. Anal abscesses result from infection of a hair follicle or a sebaceous gland, or from a fissure or suppurating external hemorrhoid. Submucous abscesses lie between the mucosa and the muscularis, and may be caused by injury or an ulcerated polyp or hemorrhoid. Ischiorectal abscesses of the acute variety are a form of periproctitis or cellulitis, involving the fossa of the same name, and caused by infection from the rectum, extension of rectal disease, or injury. Chronic ischiorectal abscess is usually tuberculous, occasionally syphilitic. An abscess occurring

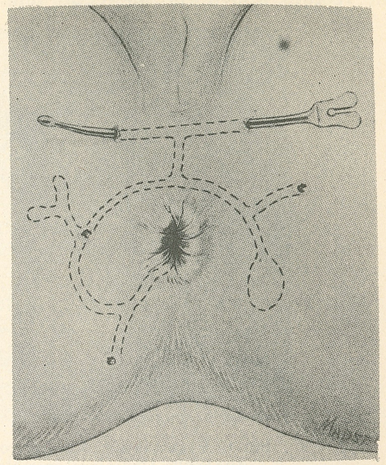

Fig. 15. Fistula-in-ano. Diagrammatic representation of some of the pathological variations of fistula-in-ano. Any part or all of this may be present in one patient.

above the levator ani is called a pelvirectal abscess. These abscesses (pelvirectal) are a urologic problem, since they result, as a rule, from disease of the urethra, bladder, prostate, or female pelvic organs, rather than from rectal affections.

Operation. Abscesses should be incised as soon as they can be localized, and without waiting for fluctuation. The cutting current serves the purpose nicely. Adequate drainage should be maintained until the accumulated pus has been evacuated and healing from the bottom encouraged to prevent recurrence. In the case of extensive involvement, this may entail irrigations with boric or saline solutions.

FISTULA-IN-ANO

Definition. A fistula is a persistent, burrowing and often tortuous sinus, the result of an unhealed abscess. It may be complete or incomplete. An incomplete fistula opens on one surface only, and is

designated *external* if it opens outside the anorectal line, or *internal* if it opens into the rectum above the anorectal line. A

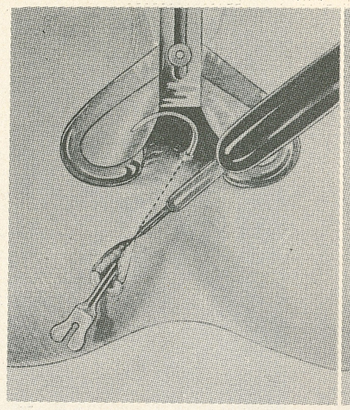

Fig. 16. Fistula-in-ano. A simple, complete fistula. Under local anesthesia, after passing a probe through the tract, the fistula is being split open with cutting current.

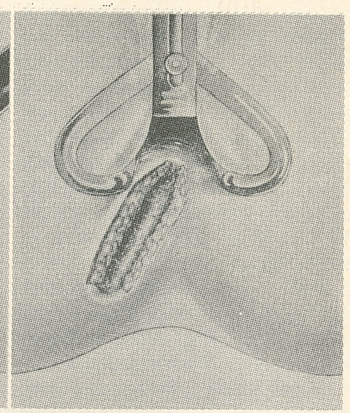

Fig. 17. Fistula-in-ano. The tract is split wide open. It is dry and bloodless. The trough of chronic inflammatory tissue is now thoroughly desiccated with the monopolar current.

complete fistula opens both above and below the anorectal line, with a continuous tract connecting the two openings. The tract may branch and have several openings, internal and external, and is lined with chronically inflamed tissue. Fistulous tracts may be found at varying depths below the skin or mucous membrane, superficial to or below the sphincter muscle. They may be specific, e.g., carcinomatous, syphilitic or tuberculous, or non-specific, i.e., inflammatory. (Fig. 15.)

Operative Technique. With the possible exception of the carcinomatous type, anorectal fistulae, both specific and non-specific, are easily eradicated by surgical diathermy. Its use provides a practically bloodless operative field; tissues retain their natural color, and the sinus tracts, whether simple or branched, are easily recognized and followed. Caudal anesthesia is preferred to infiltration, because it does not distort or conceal the tract.

A simple fistula is laid open as it is traced (Fig. 16), and the resulting fissure is destroyed by electrodesiccation, as previously described. (Fig. 17.) Fistulae that branch or involve the sphincter demand careful preliminary estimation of their extent, to avoid the pitfall of cutting sphincter fibers in more than one place. The sphincter ani muscle may be cut sharply across once with impunity. If, however, a branching fistulous tract involves the muscle is more than one place, a subsequent operation or operations should be performed after the first transection has healed. Figure 18 (A and B) shows the wrong and the right way to cut across the sphincter after tracing a sinus with a probe. The endotherm knife should be made to cut at right angles to the fibers down to the probe or grooved director. With the tract thus laid wide open, bleeding vessels are caught with hemostats and coagulated with the bipolar current. The tract is then destroyed with the monopolar current. (Fig. 17.) No sutures are used. The wound is packed wide open with iodoform gauze, which is left in situ for three to five days, and a perineal bandage applied.

It is not necessary to splint the bowels with opium and bismuth. The bowels will

probably remain inactive. If a movement takes place, it is preferable that it occur in the presence of the packing. Should the latter become dislodged as the result of a bowel movement, the wound is thoroughly irrigated with warm boric solution or normal saline and repacked carefully to insure healing from the bottom of the wound, thus avoiding recurrence. A soft, pliable scar with very little, if any, contracture is the usual result.

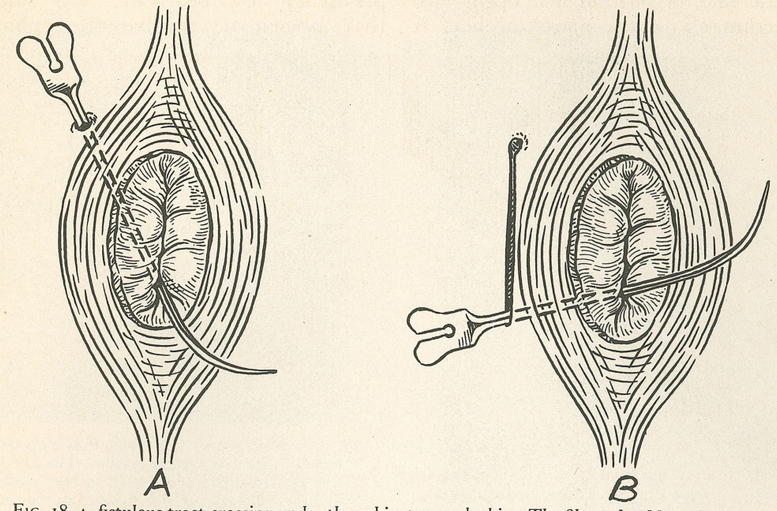

Fig. 18. A, fistulous tract crossing under the sphincter on the bias. The fibers should not be cut in this direction. The direction of the probe should be corrected by another incision if necessary as in B, so that the fibers will be cut across at a right angle.

Polyps and Other Benign Growths

Polyps are very easily removed by electrothermic methods. After suitable preparation and proper exposure, using either Cook's or Hirschman's speculum, preferably of non-conducting material, the polyp is grasped with an Allis clamp and its pedicle completely desiccated, after which it is cut off with cutting current or scissors. Another method is to use a small wire snare of the tonsillotome type connected with the active electrode of the bipolar current. The pedicle is encircled by the snare and lightly constricted; the current is turned on, slowly producing coagulation of the pedicle, after which it is severed by complete constriction. No further treatment is necessary.

Any benign neoplasm having a pedicle is, in essence, a polyp, the underlying pathology of each serving merely to place it in the category of adenoma, lipoma, fibroma, myoma, lymphoma, myxoma or angioma, to mention a few. Non-malignant growths which are the local manifestation of systemic infection, notably syphilis, tuberculosis, gonorrhea or amebiasis, are removed only after the primary disease has been relieved or corrected by appropriate measures. Adaptation of electrothermic methods to eradicate the local tumors is frequently feasible and, where this is the case, distinctly to be recommended because of the thoroughness, slight reaction and pliable scar which feature the results secured.

Malignant Growths

Of the three types of malignant growths, epithelioma, carcinoma, and sarcoma, the first is the one which, because of its superficial location and tardy metastasis, may

be removed most satisfactorily by surgical diathermy. However, there is abundant evidence that the cutting current prevents

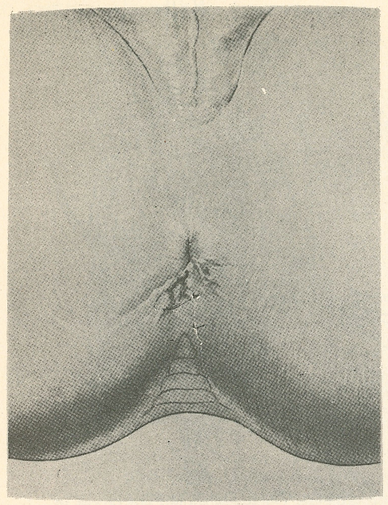

Fig. 19. Stricture of the anus. Result following a Whitehead operation. Chronic intestinal obstruction. Pencil stools.

the dissemination of malignant cells to contiguous tissues, considered by many to occur as a result of ordinary dissection. The comparative absence of hemorrhage, facilitating the recognition of tissues; the prompt control of bleeding points, conserving the patient's resistance, and the admirable character of the scar, because of minimum reaction and early healing, are advantages especially appreciated in operations requiring maximum speed and minimum trauma.

Where large, bulky, fungating, inoperable neoplasms are encountered, their removal by means of the cutting current followed by coagulation of the base is an admirable and satisfactory method of preparation for immediate or subsequent radiation therapy.

STRICTURES

In benign strictures of the rectum, especially the postoperative, post-traumatic or congenital types, posterior proctotomy with the cutting current is particularly valuable. Due to the slight inflammatory

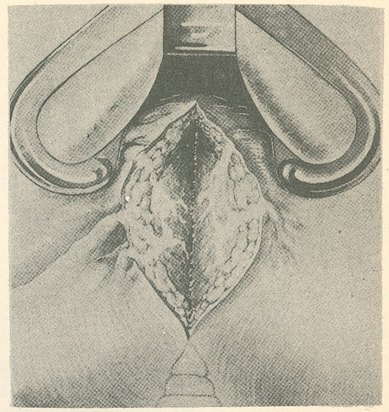

Fig. 20. Stricture of the anus. Posterior proctotomy with the cutting current. The incision was carried down posteriorly in the midline almost to the coccyx, and upward in the canal for about 1½ to 2 inches until soft tissue was reached. The opening was thus enlarged to an area admitting several fingers.

reaction, there is a minimum of fibrous tissue formation, and a soft, pliable scar, with an adequately enlarged opening, is the result.

The Whitehead operation for hemorrhoids, which unfortunately is still popular in some sections of this country, has been responsible for many cases of incontinence or stricture. The author has among his records one especially serious case of post-Whitehead stricture resulting in chronic intestinal obstruction. Rectal examination was impossible, even with the little finger. There was a rigid fibrous ring instead of an anal canal. The patient had occasional pencil-like stools, but to secure sufficient evacuation, resort to cathartics and purges to keep the stools watery was necessary. Relief for this patient (Fig. 19), a typical case, was secured as follows:

Operation. With the patient in the lithotomy position, under caudal anesthesia, using 2 per cent novocaine, a

posterior proctotomy was performed with the cutting current. The incision was carried down posteriorly in the midline almost to the coccyx, and upward in the canal for about 1½ to 2 inches, until soft tissue was reached. Thus the strictured rectum was enlarged to a diameter admitting several fingers. (Fig. 20.) The wound was packed with iodoform gauze and allowed to heal from the bottom. A most satisfactory result was obtained. The rectum was amenable thereafter to speculum and finger examination, and the patient was able to enjoy normal bowel movements.

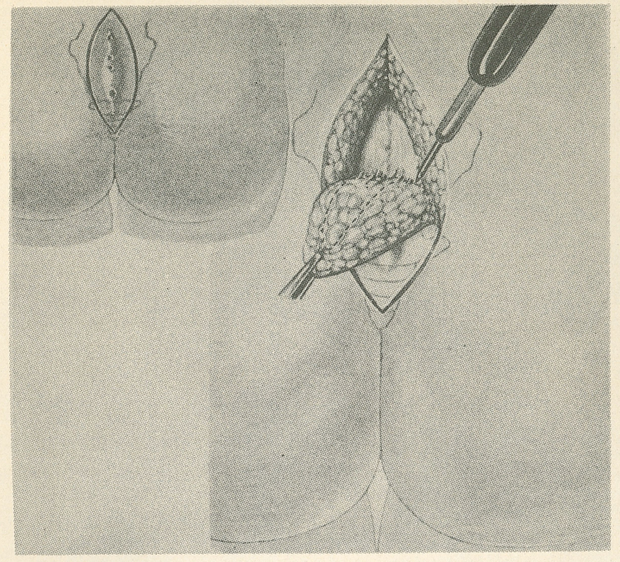

Fig. 21. Pilonidal sinuses (insert). Operation—after determining the extent of the diseased area, it is excised en masse with the cutting current.

PILONIDAL CYSTS, ABSCESSES AND SINUSES

Pilonidal cysts and sinuses are formed as sequestration cysts, i.e., from the inclusion of a portion of the epiblast (ectoderm) in places where embryonic segments unite. A frequent location is the coccygeal region. Whether the cysts are congenital, or the hairs work their way into a congenital sinus and later, because of irritation and inflammatory reaction, become encysted, is not important to the discussion of management.

The conditions most frequently encountered are simple cysts, acutely inflamed cysts, abscesses with one or more discharging sinuses and chronic suppurative branching sinuses. Their response to electrothermic methods of excision preferably, or to destruction as in fissure or fistula, is most gratifying. The wounds heal cleanly and benignly. Postoperative pain is minimal and recurrence is rare.

Field block infiltration with 2 per cent novocaine is induced. With a flexible probe the extent, character and direction of the sinuses or cavities, or both, are determined.

Two modes of procedure are then open to the surgeon: (1) exposure of the sinus or cavity, as in fistula, evacuating its contents and destroying all visibly diseased tissue by coagulation or dessication; and (2)